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PERMIT TO CONSTRUCT EVALUATION (BAGHOUSES AND RTO)

Applicant's Name

HENKEL CORP., dba ABLESTIK LABORATORIES

Company I.D.

157359

Mailing Address

20021 SUSANA RD, RANCHO DOMINGUEZ, CA 90221

Equipment Address

SAME AS ABOVE

EQUIPMENT DESCRIPTION

Application No. 496380 (Modification to A/N 493439, D18, C19 by replacing C19 with C45)

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

- A. SPRAY BOOTH, BLEEKER BROTHERS, FLOOR TYPE, MODEL NO. F-5-7, 5' 10" W. X 7' 8" D. X 7' 0" H., WITH ONE 1 H.P. EXHAUST FAN (D18)
- B. REGENERATIVE THERMAL OXIDIZER, ALLIANCE CORP., MODEL NO. KRONUS 220 RTO, 25,000 CFM, 16' 10" W X 22' 8" L X 10' –8" H, DUAL CHAMBER MULTI LAYERED CERAMIC MEDIA, WITH A 2,500,000 BTU/HR MAXON NATURAL GAS-FIRED BURNER, MODEL KINEDIZER LE, A 5 H.P. COMBUSTION BLOWER, AND A NATURAL GAS INJECTION SYSTEM UP TO 2,500,000 BTU/HR (C45)
- C EXHAUST SYSTEM WITH A 150 H. P. FAN @ 25000 CFM, VENTING ONE PERMANENT TOTAL ENCLOSURE.
- D PERMANENT TOTAL ENCLOSURE, COATING APPLICATION AREA CONTAINING THE FOLLOWING.
 - 1. VERTICAL FILM COATER # 1. (D1)
 - 2. PROCESS DIP TANK. (D2)
 - 3. VERTICAL FILM COATER # 2. (D3)

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- 4. PROCESS DIP TANK. (D4)
- 5. VERTICAL FILM COATER #4 (D7)
- 6. PROCESS DIP TANK (D8)
- 7. HORIZONTAL FILM COATER #1 (D9)
- 8. PROCESS DIP TANK (D12)
- 9. DRYING OVEN (D13)
- 10. DRYING OVEN NO. 2 (D14)
- 11. DRYING OVEN NO. 3 (D15)
- 12. DRYING OVEN NO. 4 (D16)
- 13. SPRAY BOOTH (D18)
- 14. HORIZONTAL FILM COATER #3 (D23)
- 15. DRYING OVEN NO. 1 (D24)
- 16. BAGHOUSE (C39)
- E STACK CONTINUOUS EXHAUST FLOW MONITORING SYSTEM.

Application No. 496382 (New Construction) (C43)

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

- 1. DUST COLLECTOR, UNITED AIR SPECIALISTS, MODEL NO. SFC4-2-SD, 4' 4.5" W. X 3'-7.25" D. X 7' 8" H., 4 CARTRIDGE FILTERS, MODEL SF255, EACH 1' 1.5" DIA. X 2' 2" L., 1020 SQ. FT. TOTAL FILTER AREA, PULSE JET CLEANED.
- 2. EXHAUST SYSTEM WITH A 5 H.P. BLOWER VENTING A RULE 219 EXEMPT SILICA DUMPING STATION.

Application No. 496384 (New Construction) (C44)

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

- 1. DUST COLLECTOR, UNITED AIR SPECIALISTS, MODEL NO. VF-1500-SD, 4' 4.5" W. X 2'-0" D. X 6' 4" H., ONE CARTRIDGE FILTER, MODEL SF283, 2' 0" DIA. X 3' 6" L., 283 SQ. FT. TOTAL FILTER AREA, PULSE JET CLEANED.
- 2. EXHAUST SYSTEM WITH A 5 H.P. BLOWER VENTING A RULE 219 EXEMPT SILICA DUMPING STATION.

Application No. 497060

TITLE V/RECLAIM PERMIT REVISION

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HISTORY

The Henkel Corp. submitted the above applications for permits to construct two cartridge dust collectors (C43 & C44) and to modify the air pollution control system consisting of a spray booth (D18) and afterburner by replacing the afterburner(C19) with a new regenerative thermal oxidizer (RTO – C45). The spray booth will stay the same. The new RTO will be equipped with a 2.5 mmBTU/HR start-up burner, which will replace the direct flame afterburner with a 15 mmBTU/HR burner. Thus, the new RTO is going to reduce a significant amount of combustion emissions. The two dust collector units will vent two manually operated silica powder handling stations (Rule 219 exempt equipment) to reduce the particulate emissions.

The applicant recently submitted change of operator applications for all the permitted equipment previously operated by Abelstik Laboratories. The applicant currently operates a number of equipment (roller-coaters, coating-lines, afterburner, solvent still and ovens) under a Title V/RECLAIM permit (I. D. 157359) at this location.

Henkel Corp. is an adhesive backed film manufacturer for the circuit board industries. It has a number of equipment, such as coating & drying lines, dip tanks, roller-coaters, ovens. afterburner, solvent still, I.C. engines, material sifter cabinet, bag-houses, spray booth, etc. This adhesive backed film manufacturing operation involves material mixing, application of coating, drying, control VOC and particulate emissions, cleaning, and testing operations. The Henkel Corp. has a facility-wide VOC emission limit of 118 pounds per day. This project is not expected to increase any VOC emissions.

The District database shows that the previous owner (Ablestik) has not received any odor or nuisance complaints from the public. The database also indicated that the previous owner has not received any Notices to comply or violation from the District inspectors in the last two years. This operation is subject to Rules 1128 and 1171.

The proposed revision is the 2^{nd} revision and considered a "minor permit revision" to the renewed Title V permit, as described in the Regulation XXX evaluation. The Title V renewal permit was issued to Ablestik on 2/4/07. The 1^{st} permit revision was an administrative revision issued on 4/24/09 for change operator to Henkel. This facility is also in the RECLAIM program.

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PROCESS DESCRIPTION

Henkel is a specialty adhesive-backed film manufacturing facility that is used in the electronics industries. The major portion of the business is film coating, where solvent-based resin coatings (adhesives) are applied onto a release liner called a carrier web. The resulting product is a thin film, typically 0.001-0.01 inch thick. These films possess special properties and are used in a wide variety of applications in the micro-chip manufacturing and packaging. The rolled carrier web is unwound (1 to 30 feet/min) and a film coating is applied. The coating head area is covered with a hood to capture a minimum of 95% of the fugitive emissions, which are vented to the existing thermal oxidizer. The whole room is also vented to the afterburner device as well to provide 100% collection efficiency. Some of the products coated on the horizontal coater units are immediately transferred (manually) to curing ovens which are vented to the afterburner unit.

The company manufactures adhesive backed films for the circuit board industries. Adhesive is mixed on site, by mixing epoxy resin and solvents such as acetone, MEK, NMP, etc. These adhesives are applied on the coating lines and cured in the ovens on the coating lines. The ovens and the coating lines are vented to an afterburner.

The facility purchases amorphous silicon dioxide (silica) as a raw material in fine powder form. It is received in 30 pounds bags and five gallon buckets. The material is manually transferred to smaller containers under a hood. The two new dust collectors will be venting these hoods to control particulate emissions.

OPERATING HOURS

Average: 24 hour/day, 7 day/week, 52 weeks/year Maximum: 24 hour/day, 7 day/week, 52 weeks/year

OXIDIZER DESIGN

Total maximum contaminated process flow rate: 25000 cfm Inlet operating temperature 70^0 F Outlet operating temperature from combustion chamber 1500^0 F Heat exchanger efficiency: 95%

Heat Input Rating of the burner for initial heating of the media 2.5 mm BTU/HR

Volume of the combustion zone 848 ft³

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Heat required to heat air from 70 °F to 1600 °F(worst case)

 $\begin{array}{ll} M = 15000 \; scfm \; x \; 0.075 \; lb/scf \; x \; 60 \; min/hr = 67,500 \; lb/hr \\ Cp_{70} = 0.240 \; Btu/lb \; ^oF & Cp_{1600} = 0.275 \; Btu/lb \; ^oF \\ Cp_{avg} = 0.258 \; Btu/lb \; ^oF & \end{array}$

 $Q = MCp \Delta T = 67500 \times 0.258 \times (1600 - 70) = 26.6 MM Btu/hr$

After 95% heat recovery

 $Q = 26.6 \times 0.05 = 1.3 \text{ MM Btu/hr}$

Heat input needed: 1.3 X 1050/615 = 2.2 mm BTU/HR. (Table D7, Page 948, AP 40.)

This being a RTO, no excess air is necessary for most of the time during the oxidation of the VOC. Contaminated airflow is sufficient to provide the necessary air. The applicant will use the burner to start-up the RTO only. The natural gas injection and the VOCs in the coating operation exhaust will maintain the temperature in the combustion chamber. The RTO will have a burner rated at 2.5 x 10⁶ Btu/hr for start-up, which is sufficient to fire-up the RTO. The permit condition will require a source test upon completion of the installation, which will prove the design capacity. A permit condition will also limit the use of the burner for start-up operation only.

Residence time calculation

Flow rate = 25000 cfm i.e. = 15000 cfm / 60 sec/min = 417 cfsCorrected volume = $417 \text{ cfs} \times 1960 / 530 = 1542 \text{ cfs} (1500 \text{ }^{\circ}\text{F to } 70 \text{ }^{\circ}\text{F})$ Combustion zone volume = 848 cubic feetResidence time = 848 / 1542 = 0.55 sec (greater than 0.3 sec recommended - OK)

EMISSION CALCULATIONS

The RTO must be at temperature before the coating operation can begin. It takes maximum 180 minutes to heat up from a cold start. The gas injection will maintain the temperature after the start-up operation if the VOC does not provide enough energy. Previous source test data for a similar unit indicated no additional NOx emission spike during gas injection.

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For calculation of combustion emissions, 180 minutes will be the maximum daily usage for start-up operations. The RTO will be equipped with a Maxon Kinemax LE burner with 30 ppm NOx emissions @ 3% O₂. Please see following table for combustion emission calculations.

<u>A/N 496380</u>		Alli	ance	RTO				@
	maximum	normal						
hr/dy	3	2		max he	eat input	2.50E+06	(BTU/hr)	
<u>dy/wk</u>	7	7	a:	ross heati	_		(BTU/scf)	
wk/yr	52	52					,	
load	100%	100%						
	Emission	MAX	AVE	<u>MAX</u>	30-DAY	MAX	<u>MAX</u>	
	<u>Factors</u>	(lb/hr)	(lb/hr)	(lb/dy)	(lb/dy)	(lb/yr)	(ton/yr)	
SO_2 (R1)	0.6	0.001	0.001	0.004	NA	2	0.001	
SO ₂ (R2)	0.6	0.001	0.001	0.004	0.004	2	0.001	
NO_2 (R1)	38.94	0.093	0.093	0.278	NA	101	0.051	
NO ₂ (R2)	38.94	0.093	0.093	0.278	0.278	101	0.051	
CO (R1)	39.5	0.094	0.094	0.282	NA	103	0.051	
CO (R2)	39.5	0.094	0.094	0.282	0.282	103	0.051	
N ₂ O (R1)	2.2	0.005	0.005	0.016	NA	6	0.003	
N ₂ 0 (R2)	2.2	0.005	0.005	0.016	0.016	6	0.003	
PM, PM ₁₀ (R1=R2)	7.5	0.018	0.018	0.054	0.054	20	0.010	
CO ₂ (R1=R2)		0.000	0.000	0.000	0.000	0	0.000	
TOC(R1=R2)	7	0.017	0.017	0.050	0.050	18	0.009	
ethyl benzene	0.0095	2.3E-05	2.3E-05	6.8E-05	NA	2.47E-2	1.24E-5	
acetaldchyde	0.0043	1.0E-05	1.0E-05	3.1E-05	NA	1.12E-2	5.59E-6	
acrolein	0.0027	6.4E-06	6.4E-06	1.9E-05	NA	7.02E-3	3.51E-6	
benzene	0.008	1.9E-05	1.9E-05	5.7E-05	NA	2.08E-2	1.04E-5	
formaldehyde	0.017	4.0E-05	4.0E-05	1.2E-04	NA	4.42E-2	2.21E-5	
napthalene	0.0003	7.1E-07	7.1E-07	2.1E-06	NA	7.80E-4	3.90E-7	
PAH's	0.0001	2.4E-07	2.4E-07	7.1E-07	NA	2.60E-4	1.30E-7	
toluene	0.0366	8.7E-05	8.7E-05	2.6E-04	NA	9.52E-2	4.76E-5	
xylenes	0.0272	6.5E-05	6.5E-05	1.9E-04	NA	7.07E-2	3.54E-5	
NO ₂ @ 3% exces	ss 0 ₂	30.00	(ppmv)	SO ₂ @	3% exces	s 0 ₂	0.33	opmv)
CO @ 3% exces	=		(ppmv)	2		CO _{2>>>}		grain/ft ³)
	- 2>>>					>>>		

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Toxic Compound Emissions and Risk Assessment

A Tier 2 Risk Assessment was performed to determine the health risk from the toxic air contaminants emitted from the RTO due to combustion of natural gas. The assessment calculated a cancer risk of 0.193 in a million (1.93E-07) for the residential receptor and 0.0489 in a million (4.89E-08) for a commercial receptor. The assessment also calculated both acute and chronic hazard index risks and all the risks were below 1. Thus, the Tier 2 risk assessment demonstrated compliance with the Rule 1401 requirements.

The manufacturer guaranteed NOx emissions to be less than 30 ppm at 3% oxygen level between 0.6 mmBtu/hr to 2.4 mm Btu/hr for BACT compliance. A permit condition will be imposed to use the burner only during the start-up operation, and for a maximum of 90 minutes per day for BACT and offset compliance.

There will be additional process NOx emissions from this operation. There will be 2 ppm maximum NOx emissions from the oxidation of the contaminated air inflow. The NOx lbs/hr is calculated as follows

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Lbs/hr = PPM X MW X 60 X SCF / 379 X 10<sup>6</sup>
= 2 X 46 X 60 X 25,000 / 379 X 1000000
= 0.36
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In a day maximum 3.0 hrs will be for the start-up burner operation with 0.28 lb NOx emission. Hence, 24 - 3 = 21 hrs for the process NOx emissions @ 0.36 lb/hr.

Total NOx emission in a day = $[0.36 \times 21] + 0.28 = 7.84$ lbs/day. (0.33 lbs/hr)

The applicant is proposing to install a dust collector on an existing silica handling station (Rule 219 exempt equipment). Thus, there will be reduction in the particulate emissions from this existing emission source. Amorphous silica is purchased as raw material (fine powder form) at this facility and then transferred into smaller containers under a collection hood. This hood will be vented to the dust collectors.

Application no. 496382

A quantity of powder (1000 pounds/day, maximum) is handled here once in a while. The AP-42 emission factor for particulate emissions for this type of operation is 2 pounds/ton of material added.

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Filter Area Ft² : 1020 Ft²

Filter Cleaning method : pulse-jet

Dust Collector Efficiency : 99.0%

Exhaust Blower capacity : 2200 cfm

Dust collected : closed 55 gallon drum

<u>Uncontrolled PM emissions (R1) = 1000/2000 X 2 (lbs/ton E.F.) = 1 lbs.</u>

Controlled PM emissions (R2) = $1 \times (1 - 0.99) = 0.01 \text{ lbs}$

Exhaust Air Particulate Emission Concentration (PC)

- = R2 / Blower CFM x 7,000 grain/lb / 60 min/hr
- = 0.01 / 2200 CFM x 7000 / 60 = 0.00005 grain/cfm

Air-to-cloth ratio (A/C)

A/C = Blower CFM / Filter Area = 2200/1020 = 2.0 : 1

Application no. 496384

A quantity of powder (500 pounds/day, maximum) is handled here once in a while. The AP-42 emission factor for particulate emissions for this type of operation is 2 pounds/ton of material added.

Filter Area Ft² : 283 Ft²

Filter Cleaning method : pulse-jet

Dust Collector Efficiency : 99.0%

Exhaust Blower capacity : 1500 cfm

Dust collected : closed 55 gallon drum

Uncontrolled PM emissions (R1) = $500/2000 \times 2$ (lbs/ton E.F.) = 0.5 lbs.

Controlled PM emissions (R2) = 0.5 X (1 - 0.99) = 0.005 lbs

Exhaust Air Particulate Emission Concentration (PC)

- $= R2 / Blower CFM \times 7,000 grain/lb / 60 min/hr$
- = 0.005 / 1500 CFM x 7000 /60 = 0.00004 grain/cfm

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Air-to-cloth ratio (A/C)

A/C = Blower CFM / Filter Area = 1500/283 = 5.3 : 1

The filter devices are capable of controlling the particulate emissions.

RULES/REGULATIONS EVALUATION

¤RULE 212, PUBLIC NOTIFICATION

vSECTION 212(c)(1):

This section requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. This source is not located within 1,000 feet from the outer boundary of a school. Therefore, public notice will not be required by this section.

v *SECTION 212(c)(2):*

This section requires a public notice for all new or modified facilities which have on-site emission increases exceeding any of the daily maximums as specified by in the table below. The modification to the APC system by replacing the A/B with RTO results in a reduction in combustion emissions. Also, the dust collectors will reduce the existing particulate emissions. There is no emission increase as a result of this project, therefore, these applications will not be subject to this section.

v *SECTION 212(c)(3):*

See Rule 1401 evaluation section. Public notice is not required by this section. There is no toxic emission increase from the use of coatings in this equipment since the VOC cap will remain the same. The small quantity of toxics from the combustion of natural gas in the start-up burner results in MICR below 1 in a million. Therefore, these applications will not be subject to this section.

v *SECTION 212(g)*:

This section requires a public notice for all new or modified permit units which have emission increases exceeding any of the daily maximums as specified below. There are no emission increases as a result of this project, therefore, these applications will not be subject to this section.

¤RULES 401 & 402, VISIBLE EMISSIONS & NUISANCE

Compliance with these rules is expected with the proper operation of the equipment. AQMD database has no records of any visible emissions or nuisance violations against this company in the last two years.

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- ¤ RULE 1128, EMISSIONS FROM FILM, FABIC AND PAPER COATINGS
- □ RULE 1171. EMISSIONS FROM SOLVENT CLEANING OPERATIONS

The applicant is in compliance with these requirements by using approved air pollution control equipment with a sufficient VOC control efficiency (at least 90% collection and 95% destruction). They have an existing PTE that meets 100% collection efficiency. The new RTO is expected to meet the destruction efficiency and will be conditioned to meet 95% destruction efficiency. A source test will be required to verify.

REGULATION XIII

□ RULE 1303(a), BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

(a) PM10 EMISSIONS

Use of the dustcollectors to control existing particulate emissions will satisfy BACT requirements.

(b) VOC EMISSIONS

VOC emissions from the coating application stations and drying ovens will be vented to an air pollution control system consisting of an RTO with a sufficient VOC control efficiency (at least 100% collection and 95% destruction). This will comply with the provisions of the current BACT requirements.

(c) NOx EMISSIONS

There is no increase in combustion emissions as a result of the modification of the APC. The RTO burner will be used for start-up operation only to get the bed up to 1600 degrees F. The manufacturer has guaranteed the NOx emissions to be 30 ppmv at 3% oxygen level to comply with the current BACT requirements. A permit condition will require to source test the equipment to show compliance with these requirements.

□ *RULE 1303(b)(1), MODELING*

Screening modeling analysis is not required for NOx emissions <0.20 lbs/hr, CO emissions <11.0 lbs/hr and PM10 emissions <1.2 lbs/hr.

□ *RULE 1303 (b)(2), EMISSION OFFSETS*

There will be no increase in potential VOC emissions under this project since the VOC emission cap will remain the same at 118 lb/day from the facility. The VOC emissions are currently controlled by an afterburner and the material usage under this project is not expected to change significantly by replacement of the afterburner unit. All the combustion contaminants are <0.5 lb/day. In addition, the proposed regenerative thermal oxidizer with a 2.5 mm BTU/HR burner will be used to replace an existing direct-fired afterburner with 15.0 mm BTU/HR burner. This will result in a net decrease in all criteria pollutant emissions. Thus, no emission offsets are required.

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□ RULE 1401, NEW SOURCE REVIEW OF CARCINOGENIC AIR CONTAMINANTS

As discussed in this evaluation report, this equipment is expected to comply with the rule requirements. (MICR from the combustion of the natural gas is expected to be less than 1×10^{-6} and HIA &HIC to be below 1.)

REGULATION XXX

This facility is in the RECLAIM program. The proposed project is considered as a "minor permit revision" for RECLAIM pollutants, non-RECLAIM pollutants, and hazardous air pollutants (HAPs) to the RECLAIM/Title V permit for this facility. Rule 3000(b)(12) specifies that a "minor permit revision" includes, but is not limited to any Title V permit revision that:

- Rule 3000(b)(12)(A)(v) does not result in an emission increase of any RECLAIM pollutant over the facility's starting Allocation plus the non-tradeable Allocation, or higher Allocation amount which has previously undergone a significant permit revision process.
- Rule 3000(b)(12)(A)(vi) does not result in an increase in emissions of a pollutant subject to Regulation XIII New Source Review (non-RECLAIM pollutants) or a hazardous air pollutant (HAP).

The proposed project is not expected to result in an emission increase of any RECLAIM pollutant or an increase in emissions of a pollutant subject to Regulation XIII – New Source Review (non-RECLAIM pollutants) or a hazardous air pollutant (HAP), and therefore is considered as a "minor permit revision" pursuant to Rule 3000(b)(12)(A)(v) and Rule 3000(b)(12)(A)(vi).

Since NOx is a RECLAIM pollutant for this facility, a separate analysis shall be made to determine if the proposed permit revision is considered a "minor permit revision" for RECLAIM pollutants. Rule 3000(b)(12)(A)(v) defines a "minor permit revision" as any permit revision that does not result in an emission increase of any RECLAIM pollutant over the facility's starting Allocation plus the non-tradeable Allocation, or higher Allocation amount which has previously undergone a significant permit revision process. Section B. Section B of the Title V permit shows that this facility's NOx starting Allocation plus the non-tradable Allocation is 8701 pounds. The proposed project is expected to result in a decrease of NOx emissions from this permit revisions. As a result, the proposed project is considered as a "minor permit revision" for RECLAIM pollutants.

This proposed project is the 2nd permit revision to the renewed Title V permit issued to this facility (previous owner) on February 4, 2007. The following table summarizes the cumulative emission increases resulting from all permit revisions since the Title V renewal permit was issued:

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Revision	HAP	VOC	NOx	PM ₁₀	SOx	CO
1 st revision (admin) for change of ownership from Ablestik (ID 073635) to Henkel Corp. on 4/24/09.	0	0	0	0	0	0
2 nd Revision: Modify APC by replacing A/B with RTO (A/N 496380), and install 2 dust collectors (A/N 496382/4).	0	0	0	0	0	0
Cumulative Total	0	0	0	0	0	0
Maximum Daily	30	30	40	30	60	220

^{*}RECLAIM pollutant, not subject to emission accumulation requirements

Since the cumulative emission increases resulting from all permit revisions are not greater than any of the emission threshold levels, this proposed project is considered as a "minor permit revision" for non-RECLAIM pollutants or HAPs.

RECLAIM Pollutants

Rule 3000(b)(12)(A)(v) defines a "minor permit revision" as any Title V permit revision that does not result in an emission increase of RECLAIM pollutants over the facility starting Allocation plus nontradeable Allocations, or higher Allocation amount which has previously undergone a significant permit revision process.

Since NOx is a RECLAIM pollutant for this facility, a separate analysis shall be made to determine if the proposed permit revision is considered a "minor permit revision" for RECLAIM pollutants. Section B of the Title V permit shows that this facility's NOx starting Allocation plus the non-tradable Allocation is 8701 pounds. The proposed project is expected to result in an increase of 8 lbs/day (2920 lbs/year) of NOx emissions from this permit revision, less than the starting Allocation plus the non-tradable Allocations of 8701 pounds. As a result, this proposed project is considered as a "minor permit revision" for RECLAIM pollutants.

RECOMMENDATION

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a "minor permit revision", it is exempt from the public participation requirements under Rule 3006 (b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not have any objections within the review period, a revised Title V permit will be issued to this facility.